Resource
Professionals
Group

July 12, 2010

Mr. Rob Rizzo
Bioenergy Program Manager
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020,
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Dear Mr. Rizzo,
The Menomet study report and Secretary Bowles' directive letter address the most important aspects of energy waste in American power markets: generation side process evolved from days when land, fuel and water were seen as both cheap and limitless.

Richter et al. named the efficiency issue as critical to sustainability of energy production using forest biomass in the March, 2009 Policy Forum article in *Science*, Wood Energy in America . A copy of that article is attached for your review, as is a second file consisting of letters to the *Science* editors and our responses published the following June.

Problems with stand-alone power generation only start with fuel waste – two of every three units of input fuel energy are typically dissipated. Cooling towers consume clean water in units of millions of gallons per day. And the land required for transmission corridors is harder to find, more expensive to maintain, and a genuine source of reliability concern, even in the case of wind farms and solar PV arrays. Generation companies cannot deliver the power to users unless vast acreages of land are cleared and kept out of productive use in perpetuity as right-of-way. Each mile of right-of-way 200 feet wide takes some 24 acres out possible forest cover growth with more required for substations. Massachusetts residents, like other Americans are beginning to understand the fallacy of that logic. The Manomet study and Secretary Bowles' directive letter respond to some aspects of the problem, and it is likely that power commissions across the country will shortly follow suit. That said, some questions arose as the report was discussed with some colleagues; you may find them intriguing. We would be pleased to discuss any of them further if you have an interest:

1. If an inexpensive fuel source (biomass at $3.50/mmbtu vs. natural gas at twice that or more and oil at five times that or more) is valuable enough for the Commonwealth to avoid its inefficient use, why would it not make sense to require the same care to be taken at all new energy conversion facilities including those to be fueled with more expensive design (nuclear) or fuel products (natural gas and fuel oil)?

2. Another unmentioned opportunity lies in community planning. Why would the Commonwealth not work with municipal subdivisions to modernize planning codes. As just one example, I reference the codes from the town of Leicester England. Their codes

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(along with supporting public comment documents that illustrate that people are people everywhere!) are available on-line. They ask developers to incorporate sustainable heat and hot water planning for all buildings to be constructed. Among popular approaches is distribution from central renewable energy conversion facilities located on the property as part of their original infrastructure planning. Here we would likely encourage cooling as well. The impact is lower new complex demand over its life for natural gas and electricity, greater convenience for owners/renters, higher efficiencies of conversion, better system maintenance, operational integrity, and more opportunities for distributed generation with less risk of disrupted heat and cooling during severe weather.

3. Appraisal principles assume commodity value at its highest and best use. In the case of natural gas, its potential as a clean transportation fuel is clearly a higher value use than bulk burning for heat and electricity. If no alternative renewable energy source were available for heat, cooling and heat led power through CHP that choice might be understandable. The sustainability limit is locally available biomass ingrowth adjacent to communities, and there is a valid choice.

   From a practical standpoint, the process should begin with centrally fueled fleets, then move into wider public use. Assuming concern among natural gas utilities that their business will suffer from a surge in biomass use for heat, cooling and combined heat and power, public policy can ease that fear and smooth the transition enabling them to participate in this public greening.

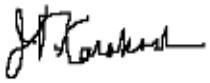
   Consider the benefits to Commonwealth residents if updated contracting and permitting rules began to ask these utilities to meet 21st century requirements whereby facilities currently burning gas for heat and/or power generation could continue, after converting their base load fuel requirement to biomass, to purchase the contracted levels of natural gas at the same artificially low bulk price to which we have all become accustomed so long as they put that gas into the transportation sector. It would first go to their own fleet operations. Beyond that, they would be encouraged to establish a fueling station network or contract with existing gasoline and diesel fueling stations.

   It is our understanding that pipeline companies have resisted moving into the transportation market until now. One expressed reason was a perceived risk that they could not simultaneously meet uninterruptable demand for thermal and power loads and transportation commitments during peak periods. The problem would be similar to that faced by many New England communities during the 1980s. Assuming a thoughtful transition period and approach with support from public officials that problem should be a non-issue.

4. Secretary Bowles' directive letter contains one point that as a practicing forester specializing in improvement and regeneration / restoration forestry I find discomforting. The wording seems to limit energy utilization of forest sourced wood to that which would not be sequestered in the growing stand or in the soil. The lack of clarity implies a penalty for practices needed to improve biodiversity, invasive species management and forest value. Activities to carry out these projects depends on the income from economic sale of low-grade timber. Good forestry depends on sales that can gain the best value from wood. Energy use near forest stands captures that value in displacing fossil fuels; foresters need the option of those markets. It is counterproductive to ask that those poor quality trees be retained in a stagnant or deteriorating stands.

I am grateful for the opportunity to submit these thoughts for consideration. In closing, I will offer some related thoughts we submitted July 6 in response to a Washington Post editorial on energy from biomass. It is on a separate page attached with this letter.

Best regards,



John Karakash, M.F. Registered Forester.

Cc: Dwayne Breger, Ph.D., Director, Renewable and Alternative Energy Development

Considerations for factoring biomass into clean energy
Wash. Post Monday, July 5, 2010; A12

WHEN YOU think of next-generation energy technologies, burning wood pellets probably isn't the first thing that comes to mind. But buried in energy proposals across Capitol Hill are policies that promote doing just that.

Many lawmakers want the government to require utilities to derive a certain percentage of their electricity from clean sources. And one of the sources that would probably qualify is so-called renewable biomass -- everything from forest debris to algae, which can be burned in some power plants. Sure, the logic goes, you produce carbon emissions when you burn this material. But when the stuff grows back, it takes carbon out of the atmosphere, too.

That logic works well if harvesting biomass results in additional net plant growth, or if you're collecting discarded forest debris that would otherwise degrade and release its carbon into the atmosphere anyway. Chopping down and burning forest that gobbles up and stores lots of carbon, on the other hand, could easily do more harm than good.

This should be a simple problem to address: Require that qualifying biomass have low net emissions across the course of harvesting, burning and regrowth. But there are political obstacles to this, not least the farm bloc in Congress, which prefers a different regulatory scheme and also doesn't want certain land-use changes to factor into such "life cycle" emissions calculations, a critical part of accounting for biomass's carbon cost.

In a recent letter to Congress, 90 scientists pointed out that biomass's accounting problems only get worse from there. Climate legislation and international treaties, for example, don't count emissions from the burning of biomass, treating it as though it produced none at all. "Improper accounting," they say, could lead to massive clearing of the world's forests. And some argue that this effect is already visible as plants open in the South to produce wood pellets for burning in European power plants, which can receive carbon credits under similar policies.

Even if you don't share the scientists' degree of alarm, it's hard to disagree with the resulting policy conclusions. Any biomass that qualifies as "renewable" or "clean" should significantly reduce emissions relative to natural gas. That calculation must honestly account for land-use changes attributable to the harvesting of biomass. And any net emissions that result should be counted as such under any carbon cap.

Our Response:

When regulatory authorities begin requiring efficiency on the generation side of electricity production beyond our current 1950s standard, the public will benefit from lower emissions, energy self reliance, economic growth at lower cost. We now waste 2 units of fuel energy from every 3, and seem proud of it, whether the fuel is biomass, oil, coal, uranium or natural gas or propane.

Responsibility lies with public service commissions, environmental regulators and legislators alike.

A recent study issued by the Manomet Center for Conservation Sciences detailed the problem of electricity production resource waste. The report was a second order response to the Massachusetts legislative call for more electricity from renewable sources, notably wood fuels.

Regrowth of the resource is less an issue than the waste of valuable fuel and clean water for cooling. The report pointed up a gap in public awareness, a technology used here called district heat and cooling at a scale between single family homes and utility power.

When applied in that size range, for example, connected commercial class buildings, or residential complexes or new developments, advanced wood heat and cooling offers answers to many problems faced across the nation: 1) eliminating wildfire risk before a conflagration starts, 2) thermal cooling to reduce power demand in summer-peaking areas, 3) renewable carbon neutral heat and cooling for older commercial buildings that need renovation and 4) jobs for local workers supplying local heat and cooling while also improving forest health; and other workers who will manufacture, install and service this proven green-energy equipment.

The world is ahead of America on this one, and we need to catch up.

But first the public must be informed, and that is more than rhetoric. Even though heat and cooling consumes more oil and natural gas than either electricity production or transportation sectors, the use is seldom discussed, less frequently with accuracy. On a capacity basis, measured as dollars-per-kW (thermal) deliverable to customers, heat and cooling with wood and other biomass is generally more affordable and effective than with other renewable or fossil sources. The other listed benefits add to that value. So why, we need to ask, does support for advanced wood combustion receive far less public support than other technologies? We do not know, but it seems time to find out.
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